Canada – Newfoundland
Flood
Damage
Reduction
Program

ANNUAL REPORT

1986/87

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
DEPARTMENT OF ENVIRONMENT
P.O. Box 4750
St. John's, Newfoundland
A1C 5T7

In Reply Please Quote
File Ref. No.

July 2, 1987

Ms. Cathy Quinn,
Micromedia Limited,
158 Pearl Street,
Toronto, ON
M5H 1L3

Dear Ms. Quinn:

The following publications you requested are attached:

1. Study of Possible Remedial Measures for the Steady Brook Area.

2. Canada-Newfoundland Flood Damage Reduction Program Annual Report (1986/87).

The User's Guide - Regional Flood Frequency Analysis for the Island of Newfoundland is available at a cost of $5.00. Cheques or money orders should be made payable to the Newfoundland Exchequer Account.

Yours truly,

Robert Picco,
Project Engineer

RP/pgp

CANADA-NEWFOUNDLAND
FLOOD DAMAGE REDUCTION PROGRAM
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TABLE OF CONTENTS

SUMMARY ii

1.0 **INTRODUCTION** 1

2.0 **STATUS OF AGREEMENTS** 1
- 2.1 Agreements 1
- 2.2 Organization 2

3.0 **EXPENDITURES** 2
- 3.1 Expenditures 1986/87 2
- 3.2 Budget 1987/88 3

4.0 **FLOOD RISK MAPPING** 7
- 4.1 General 7
- 4.2 Study Areas 7
- 4.3 Regional Flood Frequency Analysis 9

5.0 **STUDIES AGREEMENT** 9
- 5.1 General 9
- 5.2 Study Areas 9

6.0 **PUBLIC INFORMATION** 10

7.0 **WORK PROGRAM 1987/88** 11
- 7.1 Study Areas 11
- 7.2 Base Mapping 12
- 7.3 Flood Forecasting 12
- 7.4 Other Areas 12

8.0 **COMMITTEE STRUCTURE** 13
- 8.1 Steering Committee 13
- 8.2 Technical Committee 13
- 8.3 Studies Technical Committee 14
- 8.4 Public Information Committee 15

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SUMMARY OF 1986/87 WORK

The following work was completed this year: 1) designation of flood risk areas at Rushoon; 2) completion of base mapping for Parson's Pond and Cox's Cove and 3) publishing of a users' guide to complement the regional flood frequency analysis report.

Work was underway towards: 1) designation of flood risk areas for Stephenville Crossing/Black Duck, Deer Lake, and Waterford River; 2) expansion of the public information program, 4) the establishment of a flood forecasting agreement and 5) the establishment of a control measures agreement for Placentia.

The program was on schedule with the exception of: 1) the start of the Stephenville Crossing/Black Duck and Waterford River Basin area hydro-technical studies, which were delayed due to labour difficulties in the Newfoundland civil service.

Expenditures for the 1986/1987 year totalled $205,164 out of the combined Studies and Flood Risk Mapping Agreements funding of $1,950,000. Work is expected to proceed as planned next fiscal year.

1.0 INTRODUCTION

Canadians suffer needless flood damage losses amounting to millions of dollars each year. Although no major floods occurred in Newfoundland during the past year flooding was reported along the Waterford River and other streams in the St. John's area, which caused much inconvenience to residents and businesses.

Losses could be reduced or avoided if wise use was made of flood prone lands. Damage to existing structures could also be reduced by appropriate flood proofing or other remedial measures.

To reduce damages caused by floods, primarily by encouraging appropriate use of flood prone lands, a number of activities have been undertaken this fiscal year under the Canada-Newfoundland Flood Damage Reduction Program. These are outlined in the sections which follow.

2.0 STATUS OF AGREEMENTS

2.1 Agreements

The Agreement Respecting Flood Risk Mapping was a two year pilot agreement which terminated on May 21, 1983. It was amended since the work proposed under this agreement could not be completed by that date and it was desired to add new areas. An Extension Agreement, signed on June 9, 1983, for a five year period ending in 1988, includes provisions for mapping eleven areas. The total funding allocated for the five year period of the Flood Risk Mapping Agreement is now $1,470,000, to be shared equally by both governments.

The General Agreement Respecting Flood Damage Reduction was also amended and will terminate May 21, 1993.

A Studies Agreement was signed on June 9, 1983 for a five year

period. Three communities are included under this agreement with total allocated funding of $480,000 to be equally shared by both governments. A fourth community was later included under the agreement.

The present indication is that all the areas included in the Agreements can be completed within the approved funding limits, but the remaining work cannot be completed before the expiry dates of the Agreements.

Subsequent to the Agreements being signed, three other areas (Glenwood/Appleton, Glovertown and Trout River) were identified as having been seriously affected by flooding, which resulted in considerable damage to properties and much inconvenience to residents of these communities. The Steering Committee carefully reviewed the flooding problems in these areas and recommended that these be included in the Agreement for flood risk mapping. Negotiations will take place in the coming year to have these areas included in the Agreement Respecting Flood Risk Mapping.

2.2 Organization

Appended are the membership of the Steering and Technical Committees appointed to administer the General Agreement Respecting Flood Damage Reduction, the Agreement Respecting Flood Risk Mapping and the Agreement Respecting Studies.

3.0 EXPENDITURES

3.1 Expenditures 1986/87

The expenditures for this year are summarized in Table 1 and Figure 1. Out of an approved budget of $360,000 the total expenditure for this year amounted to $205,164 of which $19,013 was spent under the Studies Agreement and the remaining $186,151 was spent under the Flood Risk Mapping Agreement.

The cost underrun was due to: 1) lower than estimated cost for the Stephenville Crossing/Black Duck hydrotechnical study 2) delays in starting the Stephenville Crossing/Black Duck and Waterford River basin area hydrotechnical studies and the Parson's Pond/Cox's Cove flood risk mapping study. Much of the delay was due to a labour dispute in the provincial civil service.

3.2 Budget 1987/88

The program budget for 1987/88 is $320,000. Table 2 and Figure 2 outline the areas of expenditure.

TABLE 1

PROGRAM EXPENDITURES

Project	Activity	Cost to Mar31/86	Cost Apr 1/86-Mar31/87	Total Cost To Date
Steady Brook	Hydrotechnical Study	$151,070	$1,311	$152,381
	Monitoring	$3,840	$0	$3,840
	Remedial Measures Study	$33,600	$5,400	$39,000
	P.I. Maps	$11,200	$0	$11,200
	Drafting Flood lines	$1,895	$0	$1,895
Stephenville	Hydrotechnical Study	$90,522	$0	$90,522
	Drafting Flood lines	$2,200	$0	$2,200
	P.I. Maps	$8,900	$0	$8,900
Placentia	Hydrotechnical Study	$126,650	$0	$126,650
	P.I. Maps	$9,905	$0	$9,905
	Drafting Flood lines	$0	$0	$0
	Infilling Assessment	$0	$5,900	$5,900
Badger/Rushy Pond	Hydrotechnical Study	$153,690	$0	$153,690
	Drafting Flood lines	$0	$0	$0
	P.I. Maps	$6,000	$5,040	$11,040
Rushoon	Hydrotechnical Study	$44,800	$8,188	$52,988
	Monitoring	$735	$0	$735
	Drafting Flood lines	$0	$480	$480
	P.I. Maps	$4,370	$1,120	$5,490
Stephenville Crossing/ Black Duck	Hydrotechnical Study	$0	$59,336	$59,336
Deer Lake	Hydrotechnical Study	$0	$43,250	$43,250
Base Mapping	Stephenville and Steady Brook	$124,790	$0	$124,790
	Placentia, Badger, Rushy Pond & Rushoon	$26,725	$1,680	$28,405
	Stephenville Crossing/ Black Duck	$74,185	$0	$74,185
	Waterford River	$17,165	$0	$17,165
	Deer Lake	$41,770	$0	$41,770

TABLE 1 (Cont'd)

PROGRAM EXPENDITURES

Project	Activity	Cost to Mar31/86	Cost Apr 1/86-Mar31/87	Total Cost To Date
	Parson's Pond/ Cox's Cove	$0	$24,895	$24,895
	EM&R Inspection	$67,087	$7,702	$74,789
RFFA - Report	Printing	$4,800	$0	$4,800
- Users' Guide	Printing	$0	$2,107	$2,107
Public Information Activities		$9,470	$1,582	$11,052
Overhead		$117,395	$36,549	$153,944
Miscellaneous Expenses		$22,285	$624	$22,909
	Total Expenditure	$1,155,152	$205,164	$1,360,316

Figure 1
Program Expenses 1986/87

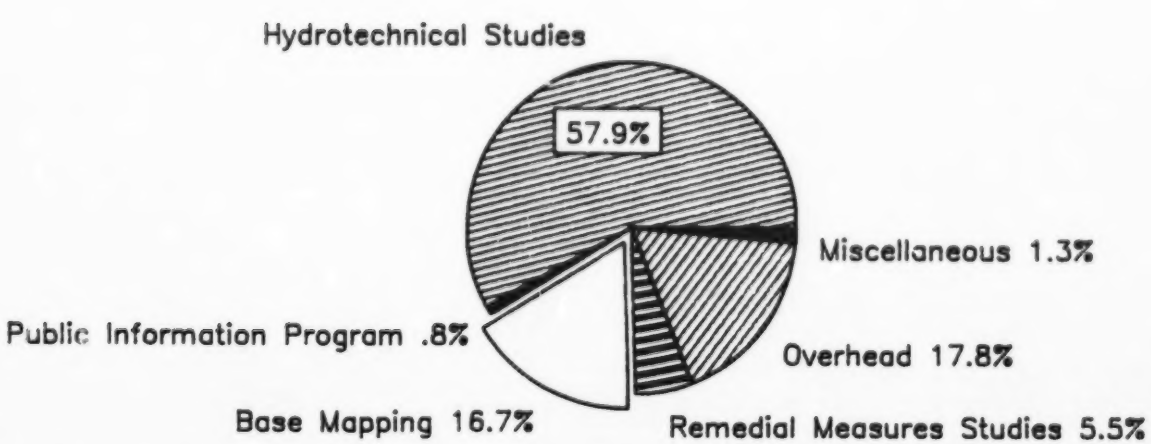
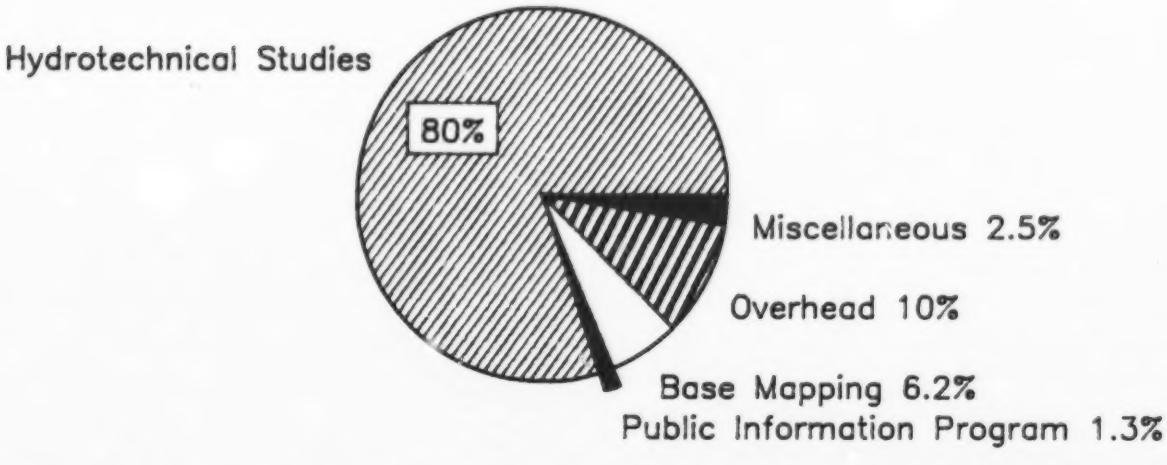


TABLE 2

ESTIMATED EXPENDITURES for 1987/88 FISCAL YEAR

Project	Activity	Estimated Cost
Hydrotechnical and Remedial Measures	Ongoing Studies at Rushoon and Steady Brook; new Studies at Deer Lake, Stephenville Crossing/Black Duck and Waterford River	$256,000
Base Mapping	New Mapping EM&R Inspections	$20,000
Public Information Activities	Public Information Maps Other Activities	$4,000
Overhead		$40,000
	Total	$320,000

Figure 2
Estimated Program Expenses 1987/88



4.0 FLOOD RISK MAPPING

4.1 General

Before flood risk maps are prepared it is necessary to conduct a hydrotechnical study for each flood prone area and obtain base maps. The results of the hydrotechnical study, the water surface profiles of the 1:20 and 1:100 year recurrence interval floods (and in some instances a large historic flood), are applied to detailed topographic maps to delineate the aerial extent of these flood levels on the flood plain. Once flood risk areas are designated, the policies as set out in the General Agreement are to be followed.

4.2 Study Areas

1. Stephenville Area
   The flood risk areas in Stephenville were designated in June 1984.

2. Steady Brook Area
   The hydrotechnical study was completed in November 1984 and the flood risk areas were designated in March 1985.

3. Badger/Rushy Pond Area
   The consultant submitted a final report in July 1985. The flood risk areas were designated in March 1986.

4. Placentia Area
   A combined hydrotechnical and remedial measures study, which provided information for flood risk maps and evaluated various structural and non-structural measures to reduce future flood damage in the Placentia area, was completed in April 1985. The flood risk areas were designated in March 1986.

5. Rushoon Area

The consulting firm of ShawMont Newfoundland Limited in conjunction with Lasalle Hydraulic Laboratories has completed a hydrotechnical study which resulted in flood risk maps of the area and evaluated various remedial measures. The flood risk areas were designated in February 1987.

6. Deer Lake Area

The firm of Nolan Davis and Associates in association with Cumming-Cockburn and Associates were hired in May 1986 to carry out a hydrotechnical study which will provide information for flood risk maps. The draft final report has been received and is under review by the Technical Committee. The flood risk areas will be designated in late in 1987.

7. Stephenville Crossing/Black Duck Area

In September 1986, Acres International Limited was hired to carry out a hydrotechnical study of the Stephenville Crossing/Black Duck areas. The study will provide information to produce flood risk maps of both areas. The study is scheduled to be completed in August 1987.

8. Waterford River Basin Area

Proposals were called and the firm of Fenco Newfoundland Limited was selected in March 1987 to carry out a hydrotechnical study of the Waterford River Basin area. Work on the study has started and will likely be completed by May 1988.

9. Parson's Pond/Cox's Cove

Terms of Reference for a historical flooding review and flood risk mapping study of the Parson's Pond and Cox's Cove areas were prepared. Proposals to carry out the study will be called early in the new fiscal year. Kenting Earth Sciences Limited completed a contract to produce base maps for the two areas.

4.3 Regional Flood Frequency Analysis

Although not specifically mentioned in the agreements, a regional flood frequency analysis has been carried out using in-house resources of both governments. A report was published in 1985 and has been distributed to interested parties. A users' guide, which focuses on the application of the technique, was published during the year. The guide will be sold for a nominal fee to interested parties.

5.0 STUDIES AGREEMENT

5.1 General

In order to determine the best methods of reducing flood damage in the future, an Agreement Respecting Studies for Flood Damage Reduction was signed for a five year period terminating in 1988. The funding available under the Studies Agreement is $480,000, which is to be shared equally by the federal and provincial governments.

5.2 Study Areas

1. Placentia Study

As mentioned, under the section on Flood Risk Mapping, a study which evaluated various structural and non-structural measures to reduce future flood damage in the Placentia area and provided information for flood risk maps, has been completed. No progress was made in negotiations for an agreement to implement the control measures recommended in the study. The measures, which included the raising of a road in the town to act as a dyke and the construction of a wave wall along a section of the beach, were shown to have a benefit cost ratio of 2.1. The provincial government has indicated a willingness to cost share the construction cost of these measures, but the federal government has been unable to provide funding.

2. Badger Study

As a part of the study for the Badger and Rushy Pond areas, mentioned under Flood Risk Mapping, various remedial measures for the Badger area were evaluated. Although none of the measures were shown to have a positive benefit cost, a flood forecasting system, implemented by the province several years ago, has been expanded with federal support by incorporating a number of improvements recommended by the consultant.

3. Rushoon Study

As with Placentia and Badger, the various remedial measures for Rushoon were evaluated by the consultant as part of the hydro-technical study mentioned under Flood Risk Mapping. Although none of the measures were shown to have a positive benefit cost, a number of the measures, including the raising of the retaining wall to prevent ice from entering the community and the flood proofing of seven houses, were implemented by the province in the interest of public safety.

4. Steady Brook Study

The report on possible remedial measures was completed. None of the proposed measures had a positive benefit cost ratio. However, the Steering Committee supports efforts to develop an enexpensive forecasting system for the area. The Deer Lake Power Company has also expressed an interest in cost sharing a flood forecasting system.

6.0 PUBLIC INFORMATION

In accordance with the plan approved by the Steering Committee to inform the public, government agencies and private companies, public information maps for Placentia, Badger, Rushy Pond and Rushoon were printed and distributed. As with the maps prepared for the Stephenville and Steady Brook areas, these maps were designed to be easily understood by the general public.

A public meeting was held in Rushoon prior to designation of the flood risk areas to inform residents of the area of the consequences of designation. A short video titled "A Friendly River" was shown at the public meeting.

An ad to inform engineers and other professionals of program's activities was placed in an engineering journal. The program display was set up in several locations, including the Avalon Mall in St. John's for Environment Week, and at Rushoon for the public meeting.

7.0 WORK PROGRAM 1987/88

7.1 Study Areas

1. Placentia:
   Discussions will continue towards an Implementation Agreement to construct the remedial measures recommended in the study.

2. Deer Lake:
   The draft final report will be reviewed early next fiscal year. Public information maps will be prepared and the areas will be designated later in the fiscal year.

3. Stephenville Crossing/Black Duck:
   Work will continue on the hydrotechnical study with a final report scheduled for August 1987. Public information maps will be prepared and the areas designated later in the fiscal year.

4. Waterford River:
   The study was started in March 1987 and will continue until spring 1988. Designation will take place in the fiscal year 1988/89.

5. Parson's Pond/Cox's Cove
   Draft terms of reference have been prepared. Proposals will be

requested from consultants in May 1987.

5. Codroy Valley
Consideration will be given to using maps presently being prepared by the province as base maps for flood risk mapping for this area. If used, these maps will save both time and money.

7.2 Base Mapping

An early tender call is planned so air photography of the Glenwood-/Appleton and Glovertown areas can be acquired in the spring of 1987.

7.3 Flood Forecasting

Since federal funding for a Flood Forecasting Agreement is currently unavailable, further negotiations towards establishing a flood forecasting system using resources available under existing federal-provincial agreements and from private firms who share a common interest, will take place.

Discussions with the Deer Lake Power Company will continue towards the implementation of a flood forecasting system for the Steady Brook area. An effort will be made, using existing federal provincial agreements to improve the flood forecasting system in operation at Badger and to implement flood forecasting systems for Rushoon and Placentia.

7.4 Other Areas

It is hoped that the Flood Risk Mapping Agreement can be amended to include three additional areas (Glenwood/Appleton, Glovertown and Trout River) and be extended in both time and funding.

8.0 COMMITTEE STRUCTURE

8.1 Steering Committee

Mr. D.G. Jeans,
Assistant Deputy Minister,
Newfoundland Department of Environment.

Mr. W.R. Haynes,
Assistant Deputy Minister,
Newfoundland Department of Municipal Affairs and Housing.

Mr. S.L. Fenety,
Director, Atlantic
Inland Waters/Lands Directorate,
Environment Canada.

Mr. D.W. Farley,
Chief, Water Management System Division,
Environment Canada, Ottawa.

Ms. E.R. Langley, (secretary),(non-member)
Inland Waters/Lands Directorate, Atlantic Region
Environment Canada.

According to the Agreements, the position of chairperson shall alternate between federal and provincial representatives. Mr. Fenety was the Chairperson for the 1986-87 fiscal year.

8.2 Technical Committee

Ms. E.R. Langley,
Inland Waters/Lands Directorate, Atlantic Region,
Environment Canada.

Dr. W. Ullah,
Director,
Water Resources Division,
Newfoundland Department of Environment.

Mr. D. Anderson,
Topographical Survey Division,
Energy, Mines and Resources Canada.

Mr. N. MacNaughton,
Director,
Surveying Division,
Newfoundland Department of Forest Resources and Lands.

Mr. R. Picco, (Secretary) (non-member)
Project Engineer,
Canada-Newfoundland Flood Damage Reduction Program
c/o Newfoundland Department of Environment.

The position of chairperson alternates between Ms. Langley and Dr. Ullah. Dr. Ullah acted as chairperson for the 1986/87 fiscal year.

Alternates

Mr. J.D.A. Keefe,
Inland Waters/Lands Directorate, Atlantic Region.
Environment Canada.

Mr. D. McBride,
Inland Waters/Lands Directorate, Atlantic Region,
Environment Canada.

8.3 Studies Technical Committee

Ms. E.R. Langley,
Inland Waters/Lands Directorate, Atlantic Region,
Environment Canada.

Dr. W. Ullah,
Director,
Water Resources Division,
Newfoundland Department of Environment.

Mr. R. Picco, (Secretary) (non-member)
Project Engineer,
Canada-Newfoundland Flood Damage Reduction Program
c/o Newfoundland Department of Environment.

Additional members for the Stephenville Crossing Black Duck Studies:

Dr. S. Beltaos, (non-member participant)
National Water Research Institute,
Environment Canada.

Dr. U.S. Panu, (non-member participant)
Hydrologic Modelling Branch
Newfoundland Department of Environment.

Mr. M.G. Goebel, (non-member participant)
Water Resources Engineer,
Newfoundland Department of Environment.

Dr. P. Hamblin, (non-member participant)
National Water Research Institute,
Environment Canada.

The position of chairperson alternates between Ms. Langley and Dr. Ullah. Dr. Ullah acted as chairman for the 1986/87 fiscal year.

8.4 Public Information Committee

Ms. G. King, (Chairperson)
Environmental Information Specialist,
Newfoundland Department of Environment.

Ms. R. Sirois, (to October 1986)
Information Directorate,
Environment Canada, Atlantic Region.

Mr. J. Gray, (from February 1987)
Information Directorate,
Environment Canada, Atlantic Region.